Amendments to the Claims

1. (Currently amended) A method for modulating radiation exposure of a multi-layer resist, comprising:

predefining a desired pattern of exposed and unexposed regions in different layers of a multi-layer resist;

setting a maximum spot size to be used to pattern the resist where a large exposure area will not impact a critical region of the pattern;

setting a minimum spot size to be used to pattern at least one critical region;

setting at least one intermediate spot size to be used in a buffer region;

patterning the multilayer resist by repeatedly depositing layers and exposing portions of each layer to radiation; and

varying the size of a radiation beam over at least one layer of the multi-layer resist using the maximum spot size, the minimum spot size, and the at least one intermediate spot size.

2. (Original) The method of claim 1 wherein the interior of a layer is patterned at a larger spot size relative to perimeter portions of the region which are patterned with smaller sized spots of radiation.

3. (Previously presented) The method claim 1, wherein the radiation beam is applied to a positive resist.

4. (Currently amended) The method of claim 1, wherein the ~~largest~~ maximum spot size is determined by calculating the functional dependency of exposure dose in proportion to laser power and intensity distribution, scanning velocity, and incremental line-spacing between laser scans.

5. (Original) The method of claim 1, wherein a sequence of different spot sizes are determined for patterning each discrete region on a layer.

6. (Currently amended) A method for patterning a multilayer resist, comprising the steps of:

depositing a first layer of resist material onto a substrate;

scanning a beam of radiation to form a moving spot ~~having a spot size~~ on the first layer and thereby exposing a portion of the first layer of resist material to the moving spot at a defined scanning speed;

depositing a second layer of resist material; and

scanning a beam of radiation to expose a portion of the second layer of resist material to radiation; and

varying the spot size of the radiation scanned in ~~beam delivered to~~ at least one region of the second layer without changing the scanning speed.

7. (Original) The method of claim 6 wherein the steps are repeated until a pattern having greater than two layers has been completed.

8. (Original) The method of claim 6 wherein the method further comprises treating the layers with a developing solution to remove the exposed portions of resist when resist is a positive resist or remove the unexposed portions of resist when the resist is a negative resist.

9. (Original) The method of claim 6, wherein the method further comprises heating the resist following at least one exposure step.

10. (Original) The method of claim 6, wherein the resist material is a positive resist.

11. (Original) The method of claim 6, wherein the resist material is a novolac resin.

12. Canceled.

13. (Previously presented) A method for modulating radiation exposure of a multi-layer resist, comprising:

predefining a desired pattern of exposed and unexposed regions in different layers of a multi-layer resist;

patterning the multilayer resist by repeatedly depositing layers and exposing portions of each layer to radiation; and

varying the size of a radiation beam over at least one layer of the multi-layer resist,

wherein the interior of a layer is patterned at a larger spot size relative to perimeter portions of the region which are patterned with smaller sized spots of radiation.

14. (New) A method for modulating radiation exposure of a multi-layer resist, comprising:

predefining a desired pattern of exposed and unexposed regions in different layers of a multi-layer resist;

patterning the multilayer resist by repeatedly depositing layers and exposing portions of each layer to radiation; and

varying the size of a radiation beam over at least one layer of the multi-layer resist such that a different spot size is used in each of a critical region, a buffer region, and an interior region.

15. (New) The method of claim 14, wherein the buffer region is patterned with a spot size larger than the spot size used in the critical region and smaller than the spot size used in the interior region.

16. (New) The method of claim 15, wherein the interior region is patterned with a maximum spot size.

17. (New) The method of claim 15, wherein the interior region is spaced at least two times the spot radii of the radiation beam used in the interior region from the inner edge of the critical region.

18. (New) The method of claim 17, wherein the buffer region is subdivided into multiple bands and the multiple bands are patterned at different spot sizes.

19. (New) The method of claim 15, wherein the buffer region has a width of approximately two times the spot radii used in the adjacent interior region.

20. (New) The method of claim 1, wherein the scanning velocity of the radiation beam is constant over the at least one layer.

21. (New) The method of claim 1, wherein the radiation beam has a Gaussian energy profile.

22. (New) The method of claim 1, wherein the radiation beam has a Airy disk profile.

23. (New) A method for modulating exposure of a multi-layer resist to a beam of radiation having a non-uniform lateral energy distribution, comprising:

predefining a desired pattern of exposed and unexposed regions in different layers of a multi-layer resist;

establishing a desired scanning speed for a moving spot of radiation to expose the resist according to the pattern;

determining a maximum spot size allowable for exposing regions of the pattern without reducing the scanning speed;

determining at least one smaller spot size needed to expose a buffer region of the pattern;

establishing a buffer region in which the smaller spot size will be employed to buffer a critical region;

patterning the multilayer resist by repeatedly depositing layers and exposing portions of each layer to a moving spot of radiation while varying the size of the spot over a particular layer of the multi-layer resist, using the smaller spot size to expose the buffer region.

24. (New) The method of claim 23, wherein the buffer region is patterned with a spot size larger than a spot size used in a critical region and smaller than the maximum spot size used in an interior region.

25. (New) The method of claim 24, wherein the interior region is spaced at least two times the spot radii of the radiation beam used in the interior region from the inner edge of the critical region.

26. (New) The method of claim 24, wherein the buffer region has a width of approximately two times the spot radii used in the adjacent interior region.

27. (New) The method of claim 23, wherein the buffer region is subdivided into multiple bands and the multiple bands are patterned at different spot sizes.